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Pentium III
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TEST LABS

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Whether we're talking about the home or business market these days, buyers are really taking up color printers. In some cases, literally.

In fact, among the rather impressive claims that surround Tektronix's solid-ink color printers (a competitor to many laser printers on the market), is that neither detectable fading nor ink streaks are visible.

But, as Harvey Shaffner, Tektronix Canada Inc.'s national sales manager was quick to point out regarding the edible ink sticks: "I can tell you, it doesn't taste all that good!"

Oh, really, Mr. Shaffner?

The point, according to the company, is all about being environmentally friendly — as opposed to putting a kink into the snack market. Indeed, Tektronix is certainly upfront that the sticks are food-testing and definitely not for eating.

Sell? Imagine the possibilities!

Upon noting my pointed interest in Tektronix's edible ink, Rich McKee, general manager of Tektronix Canada Inc., interjected: "The last thing we want is to have people eating our ink!"

Tektronix's real theme has to do with pushing the penetration of color in corporate printing, both via solid-ink printers like the Phaser 840 and color laser printers like the Phaser 780. Indeed, International Data Corp.'s revenues from desktop-color laser printers will show a compound annual growth rate of 36 per cent between 1998 and 2002. (Compound annual growth for unit shipments in the category is predicted at 43 per cent over that same time period.)

Of note, last month Tektronix announced it's moving from an authorized pre-approval model to a post-sales registration model, to deliver "open sourcing" to the channel. For more on the printing market, please check out this issue's special feature "Printer '99," (page 12), by CCM's Associate Editor Jeff Evans.

Epson Canada Inc. was among the vendors exhibiting at the recent Canada/Canada West show in Vancouver. Product marketing coordinator, Tim Latta, demon-



Consuming Consumables?

"The last thing we want is to have people eating our ink!"

— Tektronix Canada Inc.
Rich McKee

strated a number of new offerings, including the \$799 Epson Color 900 ink-jet printer, which the company says prints 12 black pages-per-minute or 10 in color — at 30 per cent page coverage. But what about the printer's ink?

When asked about the edibility of his company's consumables, Latta explained Epson's ink-jet printers (with the exception of some very high-end models) use dye rather than pigment to color its ink, in the interest of less toxicity. "I could probably lick that cartridge and I wouldn't die," he quickly added. "But I won't!"

Good call, Mr. Latta.

Of note, Epson recently introduced its \$999 PhotoPC 750C megapixel camera, to deliver a glimpse by 10-inch photos at resolutions of 1,600 by 1,200. (Along with all sorts of nifty features like using solar energy to save battery life, PowerPoint presentations can be downloaded from the PC to the camera — the camera can be hooked to a multimedia projector or a TV, for presentation!) The camera can also be directly hooked up to a number of Epson Stylus color ink-jets, for printing without a PC.

The Lexmark 5770 Photo Jetprinter, priced at \$600, takes the concept one step further. Using built-in slots, it can print photos from any camera using CompactFlash or SmartMedia memory, without involving a computer.

Expect substantial growth in quality color printers and the accompanying lucrative consumables as the market for digital cameras expands. Meanwhile, as the price premium for corporate color continues to drop, you'll see more buyers devour color and color-capable printers as alternatives to monochrome lasers.

Here's something worth pointing out: To further its promotion of color printing, Tektronix continues to offer free black ink to customers of its solid-ink-based color printers.

All you can eat: ?

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INDUSTRY FLASH



Your 2000 Rage Bankers

(NR) — Swiss bankers have announced that the Swiss banking transfer network will effectively be closed for four days over the New Year's break, owing to worries about how bank closures will operate.

The Swiss Bankers Association (SBA) has warned members to be extremely wary of sending transfers that operate during the period Dec. 31, 1999, to Jan. 3, 2000. Owing to the risk of problems at any stage in the transfer. The SBA said it had raised the recommendations after consultations with a number of parties, including the Federal Banking Commission, the Swiss central bank and the Swiss Stock Exchange. Transfers over the four-day period which originate in, pass through, or terminate in Switzerland are requested by the industry officials said.



SAP is Bigger in Smaller Businesses

SAP Canada Inc. says its Small and Medium Enterprise business unit (targeting organizations with revenues of less than \$250 million) has exceeded revenue expectations of \$10 million for 1999. In fact, the unit will achieve more than \$12 million in sales, according to Len Vanapall, director for SAP Canada's small and medium enterprise unit. He said these results will double next year.

Sales through SAP Canada's Certified Business Solutions (CBS) account for more than 90 per cent of new SAP Canada customer signings.

Key to the focus on smaller businesses is SAP's Accelerated SAP methodology. CBS customers experience an average implementation of 30 weeks, SAP claims.

SAP's CBS sales are handled by three Canadian resellers: PinTech Services Ltd. of Calgary, Optimum Software Solutions of Toronto, and Primeoasis Inc. of Montreal.

It now, Rotech went public on the Alberta Stock Exchange last October. Then in December, the company acquired Canadian Consulting Associates Ltd., also of Calgary. The combined company is expected to have 30 SAP clients and \$10 million in revenues.

CORRECTION Supercom's Digs are Big!

Supercom's new Merkle, Ont., headquarters are a healthy 30,000 square feet. We left all a note in our recent coverage of that facility's opening and the publisher's 10th anniversary celebrations (COW January, page 8). Our apologies! gy



"I love you, man."

— Sun Microsystems CEO Scott McNealy, to Oracle CEO Larry Ellison, during a Dec. 14 press conference.

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Speedy Processors

Redefine Low-End Computing

While most companies would consider an 80 per cent market share the pinnacle of success, it's just not good enough for Intel Corp., at least according to its one recent news report. It seems that the company's hold on CPUs for PCs has fallen slightly below that lofty height and it's the low end that's to blame.

In its "November Retail Hardware Report," Roston, Va.-based IDC data reports that sub-US\$1,000 PCs made up 39.5 per cent of the U.S. market in November. A year earlier they accounted for 33.4 per cent.

Meanwhile, unit sales of over-US\$1,500 PCs accounted for only 10 per cent of November '98 sales, a decline of 52 per cent from November '97.

When you look at the CPUs powering these low-end machines, you might see the source of Intel's concern. According to PC Data, "AMD's K6-2 processor was the leading processor choice for sub-US\$1,000 PCs for the fourth consecutive month, with 39.3 per cent share in November. PCs based on the National Semiconductor (Cyrix) MII processor accounted for 30 per cent of sales, and

Celeron-based PCs had approximately 22 per cent."

It should be pointed out that these figures reflect the U.S. market, which is in some ways quite different than the Canadian scene. For example, a large part of AMD's presence in the U.S. market is due to its partnership with Packard Bell/NEC in the Number Two spot in retail sales in the U.S., right behind Compaq.

However, specific brand names aside, if one looks at the computer advertisements in this country, AMD- and Cyrix-powered systems are becoming a common offering, right along side the Celeron-driven machines.

When low-cost computers were not the huge market opportunity they are today, Intel served that market by "riddling down" slower processors as faster ones were introduced, but that wasn't its only strategy. The 486SX, for example, was essentially a 486DX without a coprocessor, which could be produced more economically. As originally conceived, the Celeron was essentially a high-generation Pentium II chip without Level-2 cache, which was also less costly to produce.

And like the 486SX, the early Celerons suffered performance deficiencies in some areas. It was simply demonstrated, for example, that on some benchmark tests, a 366MHz Celeron would not perform much better than a fifth-generation Pentium. Intel soon added 128KB of Level-2 cache and Celerons became competitive performers. In early January, Intel introduced two new products to the Celeron family: processors working at 366MHz and 400MHz. Intel says they offer 80 per cent and 20 per cent more performance, respectively, over the 333MHz version.

Intel says the 400MHz Celeron will cost US\$134 in Plastic Pin Grid Array (PPGA) packaging, or US\$144 in Single Edge Processor Package (SEPP) in quantities of 1,000 or greater. When the company introduced the 333MHz Celeron last August, it set the price at US\$192. Meanwhile, the 450MHz Pentium II, also introduced in

August, carried a price tag of US\$149.

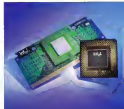
In November, AMD introduced a 400MHz version of its AMD K6-2 3D processor, along with 333MHz and 350MHz versions. This line includes a 3D instruction set the company is calling 3DNow! And AMD says Microsoft's DirectX 6.0 API (Application Programming Interface) is optimized for 3DNow, which allows software developers using DirectX to enhance the 3D performance of their applications. When announced, the 400MHz K6-2 was priced at US\$265 in 1,000-unit quantities.

In terms of what these chips cost in the real world, at the beginning of the year, a 333MHz Celeron chip was selling at retail in Canada for about \$300, a 333MHz AMD K6-2 3D cost \$180 while a 350MHz Pentium II cost about \$400. (A 450MHz Pentium II was around \$600.) This creates an interesting situation for PC makers. As the performance of the so-called budget chips — the Celerons and AMD K6-2 — improves, they become viable alternatives to the slower Pentium IIs.

This isn't just true for budget systems destined for the home. For example, Compaq Canada Inc. announced in early January that its Desktop ELN and LP-commercial desktop systems would be offered with 400MHz Celeron processors. (Compaq also offers the Pentium 315A, which uses the AMD-K6-2400 processor.) What this means for consumers is increased choice — or increased confusion depending on your point of view. For example, most computer store ads have listed Pentium II and Celeron systems with comparable features priced within \$100 of each other. ■



by
David Tomko



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System Integrators:

Are You Ready for Pentium III?

By GREGORY BENNETT



When your customers ask whether the motherboard they buy today will be compatible with the Pentium III, do you know the answer?

Asia thinks it does. The motherboard manufacturer has already posted a Pentium III-compatible BIOS update for its popular P280-640BX motherboard at <http://www.asia.com>. Abit quickly followed, with a freely downloadable Pentium III-compatible BIOS upgrade for its popular BX6 motherboard. Other board manufacturers, too, are expected to provide BIOS updates that will, *News.com* reports, allow virtually any BX-class board to be used with the Pentium III.

As well, many believe that because Abit's popular BX6 board allows custom voltage settings as well as a PCI clock divider of 48, it will allow the PCI and AGP subsystems to work correctly with the rumored 133MHz bus on a future version of the Pentium III, code-named Copernicus. Intel is expected to use an improved manufacturing process to fabricate Copernicus chips with a 180-nanometer die size, yielding chips capable of running at speeds of 600MHz or more.

The Pentium III (formerly code-named Klamath) will be officially released on Feb. 28.

The chip will be initially available at 450MHz and 500MHz speeds, and will include improved multimedia capabilities — enhancing both 2D video and 3D graphics. But according to early testers, it will provide only minimal improvements to everyday apps. The new instructions, at times, do not fit Intel's current "MMX" instruction set, are sometimes referred to as KNI (Pentium III new instructions); however, their official name is Streaming SIMD Extensions (SSE). They are perhaps best thought of as Intel's answer to the X86-64 instructions in Advanced Micro Devices' K8-2.

AMD's not standing still either. Its next-generation K7 chips are expected to ship on June 23.

Of course, there's always an element of uncertainty when predicting compatibility with unannounced products. Last-minute changes (such as the Pentium III's rumored frequency lock that could spill on and to overclocking, may affect compatibility with current designs.

Will your motherboard be able to support UDMA/66? With the forthcoming enhancement to the Ultra DMA (direct memory access) hard drive specification known as UDMA/66, expensive EIDE mass storage devices are poised to provide performance comparable to much more expensive Ultra Wide SCSI 2 drives. Abit says its upcoming products, code-named Caudino and Whiskey, are the only chipsets slated to support UDMA/66. However, this news does suggest that a new round of motherboard upgrades (or addition UDMA/66 controller cards) will be fairly when the 133MHz bus version of Pentium III and UDMA/66 devices become available later this year.

Although the 166MHz and 400MHz models include 128KB of Level-2 cache like the 300A and 333MHz chips, the new CPUs are available also in a system-on-a-chip package that the company calls Socket 370. A strong resemblance to the old Pentium design, it is only superficial, as Socket 370 processors cannot be used in older Socket 7 motherboards, the way comparing chips from AMD and Cyrix can.

However, some mainframes, including M82 and Abit, have announced converter cards that can adapt a Pentium II Slot 1 motherboard to accept the Socket 370 processor.

The new Socket 370 chips are less expensive than their Slot 1 cousins. As well, the smaller size of the new format makes it possible to shrink the size of tomorrow's PCs, possibly leading to other savings.

In fact, many resellers are expecting Celeron sales to pick up over the next few months as new system buyers realize the higher-priced Pentium II is finer of a low-cost Slot 1 (or a Slot 1 board with an adapter for a Socket 370 chip) solution. That will allow them to later drop in a 500MHz or better Pentium III as prices fall.

Sources close to Intel say the company is planning to put special emphasis on its forthcoming chips to completely eliminate or greatly reduce the potential for overclocking. However, the end of the line for overclockers hasn't yet come.

In fact, the Socket 370 version Celerons seem to be at least as overclockable (readily as recent Slot 1 models, which shrewd computer users have found can, with the right motherboard and cooling, easily be pushed beyond their stated limits.

Intel's planned for the first half of 1999, is a 32-bit workstation-class CPU and will be followed by chips code-named Copernicus and Cerebus for desktop and server applications. By mid-2000, Intel expects to be shipping its first 64-bit processor — a chip it calls Merced. Intel also provided some details on the Willamette (also 72-bit) and Plover (32-bit again) chips it expects to succeed the Pentium II and Xeon families at speeds up to 1.6Ghz, by 2004 and beyond.

Intel is already working on chips more advanced than Merced. Next in line will be a processor code named McKinley. This chip will, Intel says, achieve twice the performance of Merced and is expected to run at speeds starting around 1GHz (1,000MHz).

And a CPU called Madison, due around 2002, will be named as high-end workstation and server applications. Following it will be an IA-64 CPU (currently code-named Deepfield), which will be a "post-performance processor."

National Semiconductor, which now owns Cyrix, isn't standing still either, but it doesn't have the perfect momentum of its primary competitors. The company is pinning its hopes on a chip it calls M4, expected to debut in the 600MHz to 800MHz range, along with a chip code-named Lancelot, expected to start in the 800MHz range in the fourth quarter. ■

FOR FURTHER READING

- Motherboard and CPU reviews — <http://www.pcworld.com/updates/motherboards>
- AMD K7 — <http://www.semiconductor.com/news/processors/amd/k7/>

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Printers '99:

*The Market Focuses
on Networking,
Internet Printing,
Color and Supplies*

by Jeff Evans



For firms enabling a "paperless office," personal computers and laser, ink-jet and impact printers have caused a quantum leap in the amount of printed materials produced in the computerized world.

For reasons, the instant gratification element of printing technology offers great business opportunities in hardware sales, col-

orated printer solutions, maintenance and especially in printing supplies. For the last two years, the sales of printing supplies such as ink and laser cartridges, plus paper, has surpassed the value of printer hardware sold in Canada.

With the Web look becoming the network users' and managers' interface of

choice, network printers increasingly are displayed as icons on the user's Web browser screen for the purpose of either printing a document or managing the print system. So companies such as Hewlett-Packard, Lexmark and Xerox, which for years have offered proprietary printer management software, are now faced with the universal Web format and are working to adopt industry wide standards for printer management. When completed, this will mean much better and more usable printing solutions. In the meantime, many vendors are including a complete Web site on the built-in hard drive of some network printer models, so that end-users can simply call up the URL of a printer from anywhere in the world and exchange and print documents.

The Color of Money

Now that even near-photographic quality hard-copy has come down to commodity-price levels, color is increasingly a viable option. Over the last four years, color laser printers have declined in price from the \$20,000 range to less than \$4,000, while increased reliability and lower supply costs have reduced operating costs to a fraction of their former levels.

Common Printer Innovations to 2005:

*** Up to 10 times faster processing** — either via a RISC chip in the printer itself, or in the case of the cheapest personal printers, by taking advantage of much faster PC CPUs. Network lasers with speeds in the 34- to 45-ppm range are now the norm.

*** Higher resolution, whether real or assigned** — where most printers were limited to 300-dpi resolution a few years ago, 600 dpi is now the entry level, and many printers boast 720-, 1,200- or 1,440-dpi resolution. But understand the dubious nature of some resolution claims. For example, "1,200-dpi clear" resolution often means 600 dpi true resolution, artificially enhanced by image smoothing tricks to approximate 1,200-dpi quality. Hewlett-Packard, in particular, along with the claims of competitors such as Epson and Lexmark of 1,440 or 1,280 dpi resolution, protests that the proprietary HP postscript, ink, and software technology results in higher "real" and image quality than the higher resolution competition.

*** Photo-quality color** — in practice, true photo quality is difficult to achieve, often demanding special ink and paper combinations, and a degree of color calibration. In professional graphics art, as well as separate marketing and communications, users will demand and pay for true photo-realistic capability.

*** Networking** — There are considerable potential advantages to buying a networked printer in a package, with a pre-installed network interface card (NIC). There is likely to be a period of some confused disorientation, complexity, and compatibility problems and true Internet printing standards are unevenly adopted and built into operating system software, plus server and printer hardware. In the meantime, 10Mbps capacity is increasingly the norm.

Color printers have higher ticket prices and generally higher maintenance overheads, while color laser and ink costs several times as much per output page as black and white. Color technology often benefits from special high-quality high-priced paper and color graphics demand higher-end computers, graphics cards, monitors and more storage.

The Battle of the Brands

With the major profit opportunity coming from sales of ink and laser cartridges, the major printer vendors have a vested interest in encouraging end-users to buy only name-branded replacement cartridges (Some companies, such as Xerox, have responded by carefully engineering toner cartridges to be almost impossible to recycle for additional use.) Many corporate end-users are happy to be copies of their printer manufacturers — the potential for damage to printers, or bad-quality output makes anything but name-

brand supplies more risk than they are worth. However, for many users at the medium level of the market, off-brand supplies at discounts of 40 to 50 per cent are an irresistible bargain.

Refiller companies such as Toronto's Image Central Ltd. can reasonably offer good quality at a very attractive price — particularly in product categories such as black ink or toner.

Buyer Beware

End-users of printer supplies in the Canadian market face a hazard in the form of unscrupulous ink-refilling, scanner, photo copiers companies pretending to be the regular vendor of printer supplies, and fast-talk the unwary purchaser into buying supplies at greatly inflated prices. For legitimate resellers, part of developing a beneficial long-term relationship with customers involves staying strictly in touch with clients and pro-

viding advice on such issues.

For the home PC user, a personal letter-size color inkjet printer will do a little of everything — handling graphics and text, color and monochrome, at reasonable speed and quality. This is the reason that the color ink-jet, from vendors such as Canon, HP, Epson and Lexmark, has become the vastly preferred printer in the home market. However, a \$200-ink-jet can't handle a high-volume duty cycle from either a speed or durability standpoint, isn't particularly well suited to use as a network can't handle over-use pages and often costs much more in supplies and maintenance than the original purchase price. For most businesses, a networked monochrome laser is the standard and profitable solution. Depending on budget and needs, the reseller has to calculate the best solution in terms of speed, paper capacity and size, networkability and security. There is still a domestic market for impact

Some Players:

Brother (<http://www.brother.com>) products produce good but not traditionally focused on high-value, easy-to-use printing products for the home and small office. Products include a rare line of flat, monochrome lasers such as the HL 1040M (10 ppm personal laser), and the HL 2000 (21 ppm network laser printer). Brother is the leader in the North American multifunction market, leveraging its experience with both fax and printer technology to long cost-effectiveness, well designed hybrid products to market, including the IntelliFax 975. Finally, Brother has had a very diverse success story with its P-touch labelling system devices, including the new PT 600 model.

Canon (<http://www.canon.ca>), is the volume leader in the inkjet printer market in Canada. The company is also a major supplier of monochrome lasers (such as the LBP 3000 34 ppm/600 by 600 dpi workgroup printer), color laser printers (such as the C LBP 400 FX 400 dpi, 4 ppm color/400 ppm mono sheet), and multifunction devices (including the MultiPASS C3000 400-dpi monochrome, and MultiPASS C3000 600-dpi color models). Current Canon ink-jets include the BJC 3000 (laser printer — a 1.200 by 600 dpi printer with impressive features such as water resistant ink, and full edge-to-edge bleed printing, plus a graphics software suite). Canon also offers a BJC 10000 tablet size (11 by 17) inch color printer, the BJC 4400 and BJC-4300 desktop printers, and the portable BJC 90 and color BJC-90 models.

Canon (<http://www.canon.ca>), announced a range of consumer-oriented ink-jet printers in its product rollout in June and September. These are DPMF (Lexmark's term) i990 Canon's equivalent (Digital Equipment Corp. (<http://www.digit.com>)/products/products.html, product line), a also ported up Digital's extensive printer line. Current products (some of which are available only in Europe) include laser printers, such as the new L3000 color laser printer, dot matrix printers, line matrix printers, and a range of print networking products and print server and management products for VMS, Unix and Windows networks.

Epson (<http://www.epson.com>) has introduced with its line of Epson Stylus color printers. Currently, Epson's printer product line includes more than 30 new Stylus jet models, such as the letter-size Epson Stylus Color 400 400, 600 and 640 models and the sublimation-based Epson Stylus Color 3000, Stylus Color 1000 and Stylus Photo GX models. Epson also has a strong presence in the dot matrix/impact printer market with 11 models, including the FX-1000.

Epson (<http://www.epson.com/products/products.html>) carries a line of low Print/Printer business monochrome lasers, ranging from the entry-level Print/Printer 100 in Computer Paper (Epson's Choice version) — a 10-ppm printer with a 10MHz i86C processor and optional PostScript and network connectivity upgrade, to the Print/Printer 16 AOV — a 17-ppm printer with a 120MHz i86C processor and both PostScript Level 2 and Ethernet 10base-T network interfaces. Epson also carries three dot-matrix printers: the B L3000 Pro, B L3000 Pro, and the B L3000 Pro and B L3000 Pro.

Hewlett-Packard (<http://www.hp.com>) is the traditional leader in the business laser and networked laser products, and also in ink-jet technology. The company's dominance has been frequently challenged by competitors such as Epson, Canon and Lexmark, but HP is constantly leveraging others with improvements in network printer management, ink jet technology, ink formulation, graphics and print driver software. It also delivers entirely new product categories such as its Digital Capture and Send (DCS) technology including the Capture 100 Information Appliance, and the HP 9500 Digital Streamer.

HP has new multifunction devices including the new HP LaserJet 1100A and 3000, the HP OfficeJet Series 900 and the color-capable HP OfficeJetPro Series 1100C. There are three format HP printer models, ranging in paper width directly from 24 to 54 inches. HP has at least 30 models of network printers currently available, including six models of color LaserJet laser printers, 11 models of networked color or monochrome jet printers, 10 mono sheet laser printer models, and two network "topicals." For individuals, there are 12 personal ink-jet printer models, and one personal laser. As well, HP has five models of fax impact printer available, ranging in speed from 500 lines per minute to 1,000 lines per minute.

Lexmark (<http://www.lexmark.com>) uses its own fundamental print engines and proprietary technologies — a definite advantage if those technologies are better than the competition's version. Lexmark has just released an innovative photo center the Photo Jetter 570L, a 1,200 dpi 240 by 360 true photo quality inkjet printer, which allows the user to print directly from a digital camera's CompactFlash or SmartMedia memory card. As well, Lexmark announced support for a picture printing option that allows the Photo Jetter to print images directly from a parallel port image file drive attached to the parallel port of the printer. Added to a very comprehensive line of networked laser printers, color lasers and personal and mid-range



ORJUT 2500

inkjet printers, the Photo Jetprinter 5700 is a convincing example of how Lexmark stays in the front rank of the printer field through careful attention to both user needs and the possibilities contained in rapidly changing technology.

NBC Technology (<http://www.nbcnet.com/printers/index.html>) currently offers four printers, including two monochrome laser (SuperScript 965 Plus, 970 1200, 1200R, 1700, 1700S, three inkjets (SuperScript P90C, 960C and 980C, and two SuperScript Color Lasers (4000 and 4000R). NBC's inkjet printers tend to be excellent value, well-designed products. Its new laser printer is particularly impressive, designed from the ground up to be a leader in internet-based printing, color being, high speed and lowest cost of ownership.

Storako (<http://www.storako.com>) well known for its rugged, monochrome LED printers, had been somewhat overshadowed by larger players in recent years, but has staged a comeback campaign, with new printers and multifunction products aimed at moving the company up into the networked business printer market. Current products include eight models of single-page impact printers, six models of 24-page impact printers, 10 models of Dialog 160 monochrome printers, including the 30 ppm 600 dpi Dialog 30 select; two ink jet printers, including the 1,800 by 600 dpi 5-ppm Dialog 3000; and the Dialog 400 of multifunction devices, a 600-dpi class, four-page/capex per-minute LED printer/copier/scanner/fax.

Tektronix (http://www.tek.com/Color_Printers/) is very well known and respected in the professional graphics and technical and corporate markets — due to its proven durability, reliability and low cost of ownership. Tektronix rolled out a major new wave of printer models last fall, which have now well received in initial tests. By concentrating on the professional market, Tektronix has developed a no-compromise policy of quality engineering. The company issues its printers on two completely different technologies: part of the line uses Tektronix's unique solid-ink media, while the rest uses more industry standard monochrome or color laser technology. There are currently 12 models of Tektronix Phaser printers, all of which are color or color capable (networked or non-networked devices). Some Phaser models are oriented towards the business market, and six towards the design and publishing market. The top-of-the-line Phaser 360 tablet sized, 1,200 dpi color laser is aimed at the high end graphic arts professional, and business cap-

printer, which are the best tools for printing multi-page forms. There is also a rapidly increasing market for networked color printers, whether that means color laser printers or copiers, high-capacity ink-jets, or Tektronix's solid-ink printers.

Perhaps the most rapidly growing category of printers is the multi-function device (MFD), which is, by definition, not just a printer. MFDs typically include scanning, copying and faxing features as well as simple printing. Increasingly, networking options and high-speed monochrome laser models are offered to the enterprise market, and color ink-jet models are increasingly popular. A large installed base of color MFDs may make color faxing a common feature of the printer market in the future.

Where are the Margins?

Printer hardware, particularly in the retail and small business segments of the market, is often a loss leader. In addition to the profits in selling supplies, a major business opportunity for technically proficient retailers is in up-selling professional computer users to additional service contracts, or printer models that have extended or enhanced warranty coverage. Most printer vendors explicitly recognize the great divide between the price-oriented retail customer and the margin-oriented professional client. By establishing a relationship of trust and value for money, retailers can ride the new wave of printing to a profitable 1999. **SR**

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limited color matching and calibration features, with print sizes of up to 13 by 15 inches (folded with bleed). The Phaser 260, is described as a color magazine printer, since all it needs to form a monochrome color model is the addition of a pack of color laser cartridges. Tektronix makes a strong business case for color as a normal feature of all business printers.

Xerox (<http://www.xerox.com/xerox/>) has a full range of printer products, ranging in price from a few hundred dollars for a personal laser in desktop to hundreds of thousands for high-volume desktop systems. The product line is grouped into categories that include desktop (20 models of personal and multifunction devices), workgroup (10 models of printers and printing systems), high-volume print-production systems (30 model color (12 models, ranging from personal ink-jet to the DocuColor 40 Digital Color Press), large-format (the ColorSpace graphic arts and forms Engineering Printer line) and multifunction products (five color copier/writer models, four WorkCentre monochrome copier/writer models and 10 Document Center models). Xerox was the first to offer a 40-ppm workgroup laser. The company goes head-to-head with Lexmark, HP and other networked printer vendors, in some high-end areas it seems to have very little direct competition.

They Also Print.

A wide variety of specialized players fulfill hard copy needs in niche markets, or though they may have a low profile in Canada, nevertheless have some impressive products. **Borg** (<http://www.borg.ca>) lists 13 different models of photo and video printers (including the UP70000 10-card printer, UP700 video graphic printer, and UP70040 Medical graphic printer), while **Polaroid** (<http://www.polaroid.com/polaroid/>) has a line of video printers (including the Digital II Slide Printer), and the **ColorStar Digital Photo Printer** which can print photo quality prints onto a PC in as little as 15 seconds. **Sony** (<http://www.sony.com>) has a line of network servers including the 70-ppm P1 3000, and offers innovative printer management solutions. **Panasonic** (<http://www.panasonic.com>), a part of the giant life products conglomerate, has a wide range of laser printers (CX-P4000, CX-P4000 60-P4000), multifunctions (CX-P5000, P5-P4000), and 40/60 eight models of dot-matrix printers, and four models of Minnet color laser printers, including the CX-P420. **Nintendo** (<http://www.nintendo.com>) has a tiny monochrome printer, which is used to print out pictures created on the GameBoy handheld entertainment device, with the aid of the Nintendo video camera peripheral and software.

The Promise of LED:

Affordable Color and High Performance?

Advances in color page printing are on the verge of shaking up the well-worked business market, formulating eventual fallout into the mass market.

"Color page printing" is used for want of a more sexy term—you'll see why in a moment.

Popular ink-jet printers, like dot-matrix models, print a line at a time—you can watch the page being produced, strip by strip. This means they don't need high-end microprocessors or a lot of RAM to store an entire page's design. This helps keep the price low, ensuring their popularity, but also ensures slow speed.

The alternative has been page printers—in most cases, but not always, laser printers. Most page printers have their own CPU and RAM, some lower-end models use the processor and memory on the computer, resulting in a cheaper printer, but one that's dependent on the computer's resources. In either design, the entire page is laid out, then printed at once.

While most page printers have used laser technology, some have used an alternative—a row of light-emitting diodes (LEDs), instead. This technology has been around for years, used primarily in a series of black and white printers from Okidata. Not needing the scanning mirrors and focusing lens required by laser technology, these printers have been smaller, lighter and less expensive than comparable laser printers. At the same time, they have offered laser-quality print-outs.

Offering a "laser-quality" printer has sometimes been a bit of a challenge. Okidata Canada's general manager Lou Campbell talks about retail skepticism who haven't shown the company's products to customers shopping for a laser printer—they've known enough about the company's products to realize that they're not laser printers, but not enough to realize that they really do offer comparable quality.

While LED printers have quickly occupied a niche in the laser market for years, the advantages of the technology become clearer when stepping up to laser-quality color printers. While color ink-jets are the major player in the low-cost office market, the technology is simply too slow for adoption in the



The Okidata 6940LE 8-page color prints in just over 10 seconds.



By
Allen Zisman

"As LED becomes more widely adopted, prices could drop to a level where those color printers could become standard office equipment."

larger business market. At the same time, color laser printers have remained large, slow and expensive.

Much of this is due to the complexities in moving those mirrors and lens back and forth, while moving the paper through the printer four times (once for each color). By contrast, recently introduced LED color printers again require fewer moving parts, and follow a straight-through paper path.

The result: less complexity and better paper-handling, even with heavy paper stock, transparencies, envelopes or labels. And that translates into lower prices and faster print speeds.

While color laser printers from major players such as Hewlett-Packard offer color print speeds of four pages per minute, Okidata's newly-released Okipage 8c offers 600 dpi color printouts at 8-ppm—possible because the paper only needs to pass through the printer once.

The Okipage 8c features a base of 32MB RAM (expandable to 64MB), a 300MHz MIPS 4700 RISC CPU, and both Adobe PostScript Level 3 and PCL 5c page description languages, at a suggested price of less than \$5,000. A networked version includes 10/100Mbps Ethernet.

Okidata is no longer alone in pushing LED over laser. Lexmark recently introduced the technology into its line, with its high-end Optix Color 1200 promising 12-ppm color print-outs. The printer offers a straight-through "in-line" paper path, with four separate LED printheads. Its higher speed, however, comes at a cost of about US\$8,450.

Still, the simpler technology and higher performance of the LED models seems a compelling argument—namely that color laser printers are taking a second look at using LED for some of their future models. If so, as LED becomes more widely adopted, prices could drop to a level where those color printers could become standard office equipment.

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5. Release the

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Search web site

Back to last page

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POWER SYSTEMS

Opportunities in Serious Performance!

by Sean Carruthers

There are always customers willing to pay for the best that money can buy. While this group may be relatively small, these are the users who really drive technological progress.

Many of these buyers are gamers or are involved in high-power content creation. When they go shopping for a new system, they want all the bells and whistles, and they want something that *rips*. They're looking for the fastest PC CPU (currently 450MHz for the Pentium II, although that will soon change), despite the cost premium. They want the best and fastest optical drive available and an amazing video card with both 2D and 3D capabilities.

This month we challenged computer vendors to come up with a consumer-focused desktop system that would appeal to the most power-hungry users. Despite leaving the possibilities wide open (we didn't set a price cap, and didn't specify particular components or processors), the systems sent for review were generally similar in nature and pricing. Most of the systems were based on the 450MHz Pentium II CPU and were well-tuned out for multimedia, with DVD players and good video and audio. Surprisingly, only two of the systems featured high-capacity removable storage options (one LS-120 drive, and one CD-R). The good news: all of the systems had at least one full-sized bay free, allowing for the potential addition of a removable storage drive.

Testing this month was done using SIAPCo's Symark 98 benchmarking software. The comparison was tested at 1,024 by 768 screen resolution, with a 32-bit color depth. Regular readers will notice that the benchmarking software this month is slightly different from our previous package, Symark 32. Symark 98 is designed to work better with Windows 98 than the earlier version of the benchmarking suite. In addition, instead of simply testing office productivity suites, Symark 98 tests a number of multimedia suites for content creation, to reflect the growing use of computers for multimedia viewing and production in a home setting. Because of this month, our benchmarking now reports only three numbers: Office Productivity, Content Creation and Symark 98 (an overall score). With the release of the new package, the numbers have been recalibrated to reflect a more recent "base" platform (in this case, a Pentium II 233MHz machine with 64MB RAM, and a 4MB video card). A score of 100 on Symark 98 would reflect a machine of equal performance with that base model. Scores derived using the older Symark 32 should NOT be compared with these numbers, and vice versa.



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Compaq Presario 5660

Suggested Retail Price: \$3,499

Although it features the distinctive curve front-price at the rest of the Presario line, the 5660 stands out a little bit, with a taller case and more graphics packed inside.

Software

- The operating system is Windows XP.
- Software includes a Microsoft pack (Excite 66, Money 66 and Backup 66), Ultimate Photo Express, Photo Reader from Eastman Kodak and iMovie from Apple.

Comments

- A Compaq two-button PS/2 mouse is standard with the 5660. The keyboard is Compaq's own, and is both multimedia- and Internet-enabled (there are specific buttons for CD-player applications and mail [among other functions]) in addition to the standard Windows keyboard.
- The machine has both a 5600bps internal PCI modem (with the Realtek chip) and an Ethernet jack. This makes the 5660 ready for either a standard Internet connection through an ISP, or a cable modem. Of course, the Ethernet jack allows the computer to connect to a local network, as well.
- The 12GB hard drive offers plenty of room for multimedia applications and files.

Multimedia

- The front of the machine features a flip-up panel hiding the "Digital Audio Imaging Center." It features two USB ports and one IEEE 1394 (FireWire) port for digital video input. A FireWire port is on the back of the machine.
- In addition to the standard VGA monitor port, there is also a digital flat-panel port on the machine. Although many users may not need this port in the near future, it nevertheless makes the machine ready for the promised boom in flat-screen LCD monitors.

Eico V8

Street Price: \$1,799

Eico's machine often cost an arm towards the user's budget, and the V8 machine caused the month for well-wishers that were.

Software

- The operating system is Windows 98.

Comments

- A 5600bps internal PCI modem from US Robotics is installed.
- The 4.8GB Seagate hard drive is smaller than many of the other drives in this roundup, but should still be large enough for many users.
- At only 300MHz, the Pentium III chip included in the system is slower than the other machines tested this month. Still, performance was fairly good.
- The system includes the Logitech wireless Keyboard and the Microsoft IntelliMouse.

Multimedia

- This was the only one of the machines this month that did not have a DVD drive included. Instead, there's the speedy 40x CD-ROM/CD-RW drive.
- The EICOnano 3Dfx Voodoo card with 16MB onboard provides both 2D and 3D.

*At 4MB, the video memory is a bit low for a high-performance system, but there is an expansion slot on the rear for more SDRAM.

*The 5660 contains a DVD player and software. The DVD video playback is generally good, although there is quite a bit of motion evident, especially in patches of solid color.

*With the JBL A30 360 degree audio, sound quality is quite good.

*The joystick port (initially included on the front of new Presario models but displaced later by the FireWire port) is included on the rear of the machine.

Expandability

- There are three slots for SDRAM.
- There are two ISA slots and one PCI slot.
- Two full-sized bays are available.
- The machine features two USB and two FireWire ports for attaching peripherals and multimedia devices.

Although it turned in a slower score on the benchmarking than most of the other machines, the Compaq Presario 5660 may be just too tempting to resist for other reasons.

Firstly, with USB and FireWire ports right on the front of the machine, it is easy to attach devices. Also, with both a modem and an Ethernet port, the system seems ready to go for a few different methods of getting on the Net. With two USB and two FireWire ports onboard, the 5660 is ready for a variety of multimedia applications. Overall, it is an impressive machine, ready to take on a number of different high-performance areas.



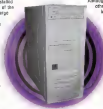
*SoundBlaster's PCI 128 card provides excellent sound reproduction.

*The system comes with the Alps Imaging AC945 multimedia speakers.

Expandability

- There are three slots for SDRAM.
- There are two full-size bays available, and one 3.5-inch slot with an external opening.
- The user can install two PCI and two ISA cards, or one PCI and three ISA cards (one occupying blank slot is shared).
- There are two USB ports.

Although it doesn't quite boast the specs of the other machines this month, the V8 model we looked at this month is worth a look for users on a budget. It's a fairly basic machine, with some room for a lot of expandable drive the road (or enough guts to right now to handle 3D gaming with ease, and a number of other multimedia applications).



Impact Arena

Street Price: \$239

With the only non-tower case submitted this month, Impact's Arena system offers high performance and expandability, while allowing the user to put the monitor on top of the computer when space is tight.

Software

- The operating system is Windows 95.

Comments

- The 16.1GB Western Digital hard drive provides plenty of space for multimedia applications and files.
- A 16MBps external PCI modem from GVC is installed.
- A Keychron Windows keyboard comes with the system, as does a Microsoft IntelliMouse.

Hardware

- Creative Labs' 3X DVD and DVD player software is included. The DVD video playback is generally good, but suffers from a pronounced vertical dithering.

Bowlett-Packard Pavilion 6300

Street Price: \$299

The Pavilion 6300 is interesting for a few reasons. The casing comes in a grey color instead of the more traditional off-white, and also features a dedicated digital camera port right on the front of the box.

Software

- The operating system is Windows 95.
- The 6300 comes with a Microsoft package (Works, Money 95, Excelsior III, Picture It!, Creative Writer II, Intuit's Quicken, Intel VideoPhone, McAfee Virus Scan, and Africa — The Samaras (on DVD)).

Comments

- The 16.2GB Perpetual hard drive offers plenty of space for multimedia applications and files.
- The keyboard is multimedia and Internet enabled, with CD player controls and one-touch Internet application launch keys.
- A 56Kbps LT PCI Modemcard is included with the system.

Hardware

- The system features a 3X Hitachi DVD player and DVD player software.

LGP Advanced Technology (Net Pro

Street Price: \$229

One of the better bargains this time out, the Net Pro desktop offers a lot of features for less money than some of the other contenders this month.

Software

- The operating system is Windows 95.

Comments

- A 10.5 Terabyte SFFbus modem is installed.
- The 9.1GB Seagate hard drive offers fast performance, and has a lot of room on-board for multimedia applications and files.
- The Net Pro comes with a 16MBps Internal keyboard and the Microsoft IntelliMouse.

Hardware

- For AGP video, the Diamond Viper 550 offers great performance, with 16MB onboard.
- SoundBlaster Live! features environmental audio for a more immersive audio experience.

- The 16MB Graphics Blaster video card provides great video display.
- The SoundBlaster Live! environmental audio card delivers excellent audio playback.
- Cambridge Soundworks PC Works' four-point multimedia speaker set up is included to take advantage of the SoundBlaster Live! 3D audio.
- S-video, comp and SFFbus video-out ports are included.

Expandability

- There are three slots for SDRAM.
- The user can install one PCI card and two ISA cards, or three ISA cards (one mounting bracket is shared).
- One full-sized bay and one 3.5-inch slot are available.
- There are two USB ports.

The Arena is a nice system with good multimedia options. Although the DVD playback on the model we tested should stand to be a lot smoother, the machine offered a good selection of video and audio compression overall. With most of the PCI slots already taken up, most external component expansion will have to take place on the ISA side and through plug-in devices. This product is definitely worth a look.



DVD video playback is smooth and high quality. Minor pixelation occasionally appears in solid patches, but not enough to be distracting.

- The 16MB ATI video on the motherboard provides a great display quality.
- Sound is of high quality. The Peak Audio multimedia speakers are very good.
- Video-out and S-video ports are included.
- There is a small port on the front of the machine dedicated to digital camera communication.

Expandability

- There are two USB ports.
- The user can install two PCI cards and one ISA card, or one PCI card and two ISA (one of the mounting brackets is shared).
- There is one full-sized bay available for expansion.
- There are three slots for SDRAM.

While the design of the Pavilion 6300's case is eye-catching, the rest of the system is worth looking at too. The DVD playback is top-notch, as is the rest of the video and audio on this system. The only minor quibble would be the control panel on the front of the machine, without some sort of cover it takes away from an otherwise attractive-looking package. With the Internet-enabled keyboard, extensive software bundle and great multimedia options, this makes a great high-performance family machine.



- Creative Labs' 3X DVD (player and) DVD player software is included. DVD video playback was smooth, although there were some subtle glitches in motion and when switching between scenes. Some pixelation is evident in solid patches, but picture quality is generally good.
- The system comes with a pair of Fennite M7 multimedia speakers.

Expandability

- There are three slots for SDRAM.
- There are two full-sized bays available for expansion, one front-mounted 3.5-inch bay, and a 3.5-inch bracket hidden inside the machine for an additional hard drive.
- The user can install three PCI cards and one ISA card, or two of each (one of the mounting brackets is shared).
- There are two USB ports.

The Net Pro desktop gives you can get more for less, with a lot of great components, but not necessarily all the newest and most expensive. The 5.1GB drive is a good example. The system offers less than the newest drive available, but still high quality and features enough specs to satisfy most users in the end, and the configure has allowed the Net Pro to perform really well in the benchmarking, offer decent multimedia performance, yet still come in at a reasonable price.



Smart Machine Viper M450

Street Price: \$2,999



Overall

Smart Machine's Viper M450 is an impressive machine, from its elegant case and expandability to the performance and isolated components and software.

Software

- The operating system is Windows 98
- Adaptive's Easy CD Creator software is included
- Microsoft's Office 97 professional is installed. Includes Word, Excel, Outlook, Access and PowerPoint
- The games Half Life Day One and Quake are included
- The DVD title Rolling Luv-A-Rama comes with the system

Components

- The case for this system is quite large, offering a lot of room for expansion. It may be a bit cramped in smaller spaces though.
- The system features IBM's 10 GB DeskStar hard drive. With a drive this size, it's hard to imagine the user running out of hard disk space for quite a while.
- An optical 80X/48X/32X iRobotics system is included
- In addition to the DVD drive, there is also a Panasonic 48x16x32x48 CD-R drive included in the system
- A Logitech Mouse Mini Playstation mouse is included with the system, as well as a Keyboard Windows keyboard

Multimedia

- Audition SX-DVD and DVD player software come with the system. DVD video playback is smooth and high quality, although there is some minor pixelation at times in rated patches

- The 128MB EISA Oracle II AGP video card provides great 2D and 3D display, and comes with its own cooling fan
- The sound card is a Diamond Monster Sound MX-300 3D PCI card, and sound quality is excellent
- Cambridge Soundworks' four-point PC Works multimedia speakers are included to take advantage of the 3D sound card

Expandability

- There are three slots for SDRAM
- The user can install three PCI card and one ISA card, or two of each type at the mounting brackets (a caveat)
- There are full-sized bays are available for components
- There are six bracket spaces available for other full 3.5-inch devices
- There are two 5.25-inch ports

Although a machine of this size certainly isn't for everyone, power users will love the Viper M450 from Smart Machine. It comes with a bundle of software, lots of room for expansion of components, but already includes enough good stuff inside to suit almost everyone's needs. The inside size of the CD burner is a nice touch, allowing users who are serious about content creation to make quick large-capacity removable backup copies of their work. And with the extra-large 10 GB hard drive installed, there's lots of room for applications and files for even the most space-hungry applications. It's hard to imagine anyone finding this machine lacking.

Supersonic Touch

Street Price: \$2,999

Distributed in Canada by Supersonic, the Touch system tested this space offers a lot in the way of multimedia and storage.

Software

- The operating system is Windows 98
- Lotus Smart Suite Millennium Edition is included
- The system comes with McAfee's Anti-Virus software

Components

- The 128 MB hard drive from Western Digital offers lots of space for multimedia applications and files, with room to grow
- The 38.4 speed LS-120 drive offers high-capacity removable storage, while remaining backward-compatible with floppy disks
- A 60X/48X/32X iRobotics is included with this system
- The Touch machine comes with a Windows keyboard and the Microsoft IntelliMouse

Multimedia

- The machine includes a front-loading 48X Pioneer DVD drive and DVD play-back software. DVD video performance is good, although a bit pixelated occasionally
- The Diamond Viper 350 AGP card with 128MB onboard offers great display quality

- Diamond also provides the sound via the Monster Sound MX300 Sound quality is excellent
- Also, Lansing's ACS 46.7 multimedia speakers are high quality

Expandability

- There are three slots for SDRAM
- There are four 3.5-inch bays are available for expansion
- There are also 3.5-inch bays on the front of the machine, although space is tight
- The user can install two PCI cards and one ISA card, or one PCI and two ISA (limit of the mounting brackets is shared)

Although it lacks a bit plain at first sight, the Touch system packs a great multimedia punch, with great audio and video components and a lot of storage space with its 128 MB hard drive. Additionally, the front-end 38.4 LS-120 removable drive is a good alternative to a floppy drive, allowing faster access to the 128MB removable disks, while remaining backward-compatible with floppies. With extra space for additional components, this system is certainly effective.

Editors' Choice



Overall

Smart Machine Viper M450

With one of the fastest machines in the system, the Viper M450 is the most impressive machine overall in terms of components, included software, multimedia performance and expandability. Power users will love the storage options and the space to add components down the road.

John Donatone is Lab Editor for Canadian Computer Wholesaler based in Toronto, he can be reached at john.donatone@ccw.ca

	Compaq Presario 1000	Lenovo E40	HP Pavilion dv6	Lenovo E40	HP Pavilion dv6	HP Pavilion dv6	HP Pavilion dv6
Processor	Intel® Core™2 Duo E6700	Intel® Core™2 Duo E6700	Intel® Core™2 Duo E6700	Intel® Core™2 Duo E6700	Intel® Core™2 Duo E6700	Intel® Core™2 Duo E6700	Intel® Core™2 Duo E6700
Cache	3MB	3MB	3MB	3MB	3MB	3MB	3MB
Memory	2GB	2GB	2GB	2GB	2GB	2GB	2GB
Storage	160GB	160GB	160GB	160GB	160GB	160GB	160GB
Display	15.5"	15.5"	15.5"	15.5"	15.5"	15.5"	15.5"
Operating system	Windows Vista	Windows Vista	Windows Vista	Windows Vista	Windows Vista	Windows Vista	Windows Vista
Hard drive	160GB	160GB	160GB	160GB	160GB	160GB	160GB
Optical drive	DVD-RW	DVD-RW	DVD-RW	DVD-RW	DVD-RW	DVD-RW	DVD-RW
Ports	4x USB	4x USB	4x USB	4x USB	4x USB	4x USB	4x USB
Video / 3D card	ATI Radeon HD 3600	ATI Radeon HD 3600	ATI Radeon HD 3600	ATI Radeon HD 3600	ATI Radeon HD 3600	ATI Radeon HD 3600	ATI Radeon HD 3600
Sound card	Realtek ALC262	Realtek ALC262	Realtek ALC262	Realtek ALC262	Realtek ALC262	Realtek ALC262	Realtek ALC262
Speakers	2x 2W	2x 2W	2x 2W	2x 2W	2x 2W	2x 2W	2x 2W
Wireless ports	802.11n	802.11n	802.11n	802.11n	802.11n	802.11n	802.11n
Modem	56Kbps	56Kbps	56Kbps	56Kbps	56Kbps	56Kbps	56Kbps
Network	10/100/1000	10/100/1000	10/100/1000	10/100/1000	10/100/1000	10/100/1000	10/100/1000
Keyboard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Biometric	None	None	None	None	None	None	None
Dimensions	14.1" x 9.4" x 1.4"	14.1" x 9.4" x 1.4"	14.1" x 9.4" x 1.4"	14.1" x 9.4" x 1.4"	14.1" x 9.4" x 1.4"	14.1" x 9.4" x 1.4"	14.1" x 9.4" x 1.4"
Weight	4.4 lbs	4.4 lbs	4.4 lbs	4.4 lbs	4.4 lbs	4.4 lbs	4.4 lbs
Price	\$1,199.99	\$1,199.99	\$1,199.99	\$1,199.99	\$1,199.99	\$1,199.99	\$1,199.99



Overall

Groupware's definition is broadening to include business-to-business collaboration and knowledge management.

By Antonietta Polizzi

Collaborative computing today is much more than deploying a mail server or a messaging system. It's about a platform that allows an organization to extend collaboration outside to customers and suppliers, and maximize its human capital.

Groupware has traditionally been considered to be software that lets employees collaborate over a company's LAN, WAN and corporate intranet. Now, groupware's definition is broadening to include business-to-business collaboration and knowledge management.

Today's business imperative is not just about infrastructure. It's about setting up shop on the Web, engaging and retaining customers and making sure employees who are in contact with clients have the most current information.

"The Web is opening up new ways of having collaborative computing applications work together. It is making systems cheaper, easier to access and the Web is increasing the functionality of applications," said Dave Marshall, director of Canadian software research with Toronto-based International Data Corp. (Canada) Ltd.

The next wave of collaborative computing, once we get past the Y2K crunch, will be about companies using existing resources more efficiently, Marshall said.

Collaboration

Some Key Products

Products:

Microsoft Exchange Server 5.5
Download/Info/Link Edition
<http://www.microsoft.com/exchprod/exchprod.asp?prod=EX5.5>

Vendor: Microsoft Canada Co.

Feature Highlights

- Microsoft Exchange Server 5.5 Download Edition contents:
 - Exchange 5.5 server
 - Outlook 5.0 client
 - Microsoft Mail connector
 - Microsoft Exchange and Lotus Notes conversion
 - Internet news service
 - Microsoft Visual InterDev
 - Microsoft Exchange chat service
 - Support for Internet protocols such as SMTP, POP3, IMAP4, LDAP v3 and NNTP
- Exchange Server 5.5 Enterprise Edition contents:
 - Internet catalogs
 - 6 MB personal
 - IBM OpenView/VSE and VM/385 connectors

Platform:

Microsoft Outlook Server support in Exchange Server Enterprise Edition requires Windows NT Server 4.0 Enterprise Edition. Exchange includes a version of Outlook for Windows 95 and Microsoft platforms.

Pricing

The Standard Edition starts at \$5500, while the Enterprise Edition starts at \$20000. The Microsoft Exchange Server Standard Edition, with the client access licenses is \$2500. The Microsoft Exchange Server Enterprise Edition with 25 client access licenses is \$22000.

Products:

Novell GroupWise 5.0
Age: Please email config@novell.com

Vendor: Novell Canada

Feature Highlights

- GroupWise 5.0 features:
 - Internet mail
 - 4 Mail capabilities
 - Document management
 - Personal calendaring
 - Tasks and message management
 - Group scheduling and task management
 - GroupWise cloning
 - Conversion utility
 - Personal address book
 - BMP4 and POP3 server support
 - NNTP support
 - 2500 and 4 MB 32 parallel version of GroupWise WebAccess
 - GroupWise WebAddress
 - Multiple language support
 - GroupWise agents and gateway
 - eCard

Platform:

GroupWise 5.0 provides clients for Windows NT 4.0, Windows 95, Windows 3.11 (32-bit and CSET) and Unix. The server runs on NetWare 4.11 and Open-VMS and Windows NT Server 4.0.

Pricing

Cost ranges from a \$5500 250 for a five-user license to a \$25000 250 for a 250-user license.

Products:

Notes 5.0 Suite 2
Connect 10 Suite 2
<http://www.lotus.com>

Vendor: Lotus Development Canada

Feature Highlights

- Notes 5.0 Suite 2 features include:
 - New join interface
 - Readiness page to track up/down, online/offline, Web sites, and messages
 - Enhanced Calendar and Scheduling features
 - Server support of Internet protocol MIME, POP3 or IMAP4, LDAP and security using SSL, S/MIME, and X.509 certificates
- Connect 10 Suite 2 features include:
 - Job remitting and distribution
 - Security catalog
 - Design applications with CORBA standard distributed objects, Java or JavaScript
 - Database administrator

Platform:

There are Notes clients for Windows 95, Windows NT 4.0, Microsoft PowerPC 74 and PowerPC 6. The server supports Windows NT 4.0, AIX, HP UX, Sun Solaris, ICL, OS/386 and OS/2.

Pricing

Notes 5.0 Suite 2 is licensed only for \$5000. Notes Designer for Connect 10 suite is \$2500.

Helping: Scheduled for the end of 1995

Moves Beyond E-Mail, Messaging

Collaborative Computing Defined

Five years ago, collaborative computing was defined as some type of e-mail that drove a simple scheduling application. Today, the definition starts at the notion of multifunction groupware and messaging and stretches out to all manner of collaborative computing tools, such as corporate whiteboards, video-conferencing, chat, project scheduling, workflow and document management — across continents as far-flung as the Internet's reach.

Ross Cheung, president of Toronto-based EnterVoice Inc., an e-commerce solution provider, says messaging is but one aspect of collaborative computing, and as such, isn't always required in a collaborative solution. "Collaborative computing is any tool that facilitates collaboration and communication," he said, explaining that that includes a wide range of technologies, even tools which don't utilize the Web at all.

But at its most basic, collaborative computing is technology that is designed to help people work together. "It would be a mistake therefore for organizations to be trying to make long-term deployment decisions based on which e-mail system they feel inclined to deploy," said Nathaniel Palmer, senior analyst with The Delphi Group Inc. in Boston.

According to Palmer, as has happened in the desktop suites arena, there's not enough differentiation between the messaging aspects of the leading products — Lotus Development Corp.'s Notes/Domino Server, Microsoft Corp.'s Exchange Server or Novell Inc.'s GroupWise — to push objective consideration of the offerings one way or the other. He said as more companies embrace Web-based collaboration and business applications become Web-enabled, collaborative technologies are beginning to be embedded as standard features in all applications. "Anyone who has made a computing purchase in the last 18 months has the infrastructure for collaborative computing. You have programs in every box today."

Groupware to the Next Level

Businesses are taking internet-based groupware to the next level by collaborating with customers and suppliers over internet, extranets and the Internet. The payoff: fewer mistakes in product design, data entry and manufacturing; faster agreement on issues; and faster time to market.

"Collaboration is a department or an organization is essential but collaboration across functional boundaries is even more important today than before. Extending that information network outward is becoming more and more important to the competitive nature of competition," Cheung said.

One issue is the vast amount of information found on the Web, and the other is that companies want very sophisticated tools to access the information, he said. "The level and sophistication of the interface is much greater now. Organizations are saving time, in order to profile visitors, find out what interests them, and set up systems that will personalize questions and will show visitors certain information based on that query," Cheung said. "So there is much more data out

there and more and more businesses want that functionality."

According to Kevin Hester, sales and product marketing manager for Microsoft Exchange with Microsoft Canada Co., the market place competition has demanded businesses operate with less inventory and faster turnaround time. "In order to do that you need to get rid of paper-based processes, and you need to automate processes around this supply chain."

Hester notes that every business is achieving this functionality through business-to-business collaboration. Businesses are embracing the standard features of groupware — messaging, workflow and document management — to their customers and suppliers via their internet and extranets.

But businesses aren't necessarily doing business-to-business collaboration as part of standard groupware packages. "Groupware has become fixed in people's minds as Lotus Notes, but it's really for broader collaboration and information sharing," says Adnan Levins, a senior consultant at research firm CAP Ventures Inc. in Norwell, Mass. Think of this broader collaboration in terms of "super-workgroups."

This super-workgroup concept is taking hold in large companies. Many organizations, for example, want to automate the procurement process over contract and extranets, says Levins. Extending groupware capabilities to their customers and suppliers, these companies hope to improve purchasing practices for both direct resources — materials used in manufacturing — and indirect resources, which include goods and services supporting maintenance, repair and operations.

The Delphi Group's Palmer agrees that collaboration between vendors and customers is important, but he warns the tools that enable extended groupware capabilities aren't quite up to snuff. "Technologies for business-to-business communications are much more primitive than companies would want them to be," he said.

The technologies may be primitive, but companies are forging ahead with their collaborative efforts using traditional groupware technology, says Ross Chevrolet, director of technology with Novell Canada. He said with GroupWise 5.5, users can write a document and through the WebPublisher interface make it available on the Web. "That's the first step. Since the information store is fully secured by Novell Directory Services, organizations can take collaboration a step further. Businesses can give their customers a unique ID and password and they can access certain information."

Real-Time Collaboration

A big part of business-to-business collaboration involves real-time collaboration of instant communication. Lotus's Sametime technology will allow users to communicate instantly with co-workers and work simultaneously on documents or other files. The Sametime products can also be used for on-line meetings and application sharing. Lotus is also providing tools to support the development of third-party applications for Sametime.

"All of our Web-based usage has been about asynchronous communication. We will move to R5 to a concurrent model," said Peter

If you hear someone sneaking up behind you, it is probably not a taxman. and what he is no surprise.

Which Applications Should You Sell in 1999?

by John Newcombe

If you hear someone sneaking up behind you, it's probably the taxman. What he wants is to surprise you. Each year at this time, Canadians begin the annual task of collecting their tax information, as they face the daunting spectre of preparing their annual return. Many people will give the job to their accountant or a tax preparation service. But there is another choice — to use tax preparation software. It makes the process less time-consuming and more secure, and removes some of the mystery from the whole process of preparing your return. And don't I say, it may even be more fun!

Although this article deals with several leading packages, it's only a selection; there are literally hundreds of packages available. And note: the firms designing tax software work within very narrow time windows, between updating the software to reflect tax changes, getting the package approved by Revenue Canada and sending it out the door before people get their T-4 slips. Therefore, the following discussion is based on the headstart versions of the software — there may be slight differences in the final versions.

In general, all of the software reviewed delivers on the promise of simplifying the process of preparing a tax return. All of the packages offer good value, provide comprehensive tax information and planning tools far above the same amount as tax preparers charge for one basic return. (This software could be used by multiple family members.)

The packages also provide built-in help and tax tips and have a diagnostic routine to verify there are no major errors or missing information. Given that most of the packages deliver the same information, the choice of a package is largely dependent on personal taste. For this reason, this review will not rate the packages, but will highlight key features and benefits.

Many people choose tax preparation software because they are not comfortable with complex tax rules and want some help. All of the packages offer a "guided tour" approach, to walk the user through the steps of preparing their return. Several of the packages use multimedia content to assist the user, others just provide a path to follow through the forms and offer context-sensitive help. The multimedia approach does add some jazz to the process, however it requires more hard drive space and more computing power. Some provide advice from tax experts. But for users who are comfortable with the tax rules and prefer to stock their return as their own way, the packages also allow for that flexibility.

The leading packages now offer the ability to download software directly, while still providing boxed options. The Internet also allows for easy bug fixes. This method of distribution also encourages the firms to keep the size of the executable file to a minimum, so users aren't deterred by an extended download.

In recent years, tax software has included increased planning capabilities. These new products are useful throughout the year. The packages typically provide a Registered Retirement Savings Plan (RRSP) planner to calculate the tax benefits of various contribution levels and maximum retirement income. Some of the planners can also optimize RRSP contributions between a couple, by showing the effect of income splitting using a spousal contribution. For the early

insatiable-hungry user. CanTax will predict total lifetime income and the amount of tax to be paid. (This can get somewhat depressing.)

No discussion of tax software would be complete without at least a mention of the e-file program run by Revenue Canada. The leading packages (QuickTax, CanTax and HomeTax) all can generate the files required to electronically file your tax return. Unfortunately, Revenue Canada will require that you use a middle party for the actual transmission. However, the software firms do provide facilities for the e-filing service themselves (either under contract or directly). In addition, all of the packages offer professional versions for tax preparers, which allow personal users to have a local provider file their return. The cost of the service varies from \$4.95 up to \$50.

E-filing a return means the information is directly entered into the Revenue Canada computers and therefore reduces the time to process a refund. If a refund is sizable, a reduction of between one to three weeks in processing a refund can offset the purchase cost. However if the user either owes money or has a relatively small refund, e-filing is less appealing. Last tax season, Revenue Canada ran a pilot project in the Maritimes where taxpayers could file their returns using a touch-tone phone, providing the speed of e-filing without the cost of the service bureau. The trial was apparently unsuccessful, so we might expect this service to be rolled-out nationwide.

Some packages, alphabetically:

CanTax T-1 98

CanTax This is the granddaddy of tax software packages and in past years that others shunned! But last year the package was

reworked and is now far more visually appealing — although the developers do permit an using Courier 8 to display some information, which is harder to read. I was impressed with the business income section where the information was collected using a simple template, rather than the more complex tax schedule. CanTax also includes a very extensive library of help files and advice (including Revenue Canada documents). One important note, due to tax reform in Quebec, CanTax cannot produce a Quebec income tax return.

CanTax forgoes multimedia content, relying on an extensive text library of help and tax tips (from tax writer Evelyn Jacky). This package is sold through resellers and directly, either in box form or electronically (a 1.3MB executable).

Cost: \$36.95

<http://www.cantax.com>

HomeTax

HomeTax comes in both 16- and 32-bit versions. The 32-bit version has enhanced graphics and is a full multimedia product, including tutorials on how to use the program and video tax tips. This year, look for greatly improved planning tools, in particular the "Your RSPs in Action" module to optimize RSP contributions and retirement income, and a planning tool for Quebec residents to determine whether they should be using the General or Simplified rates. The package has beefed up the tax tip section, including tips from commentator Dean Costello and context-sensitive tax information.

Cost: \$29.95

<http://www.merrill.com/~hometax/>

QuickTax

This package comes in a Deluxe and a Basic version. The Deluxe version adds multimedia features and some additional planning features. QuickTax is from Intuit, (the maker of Quicken), so it is able to import tax data directly from Quicken. QuickTax still provides one of the most visually appealing user interfaces, with easy-to-read screens and a simple set-up box.

There is also a nice graphic summary displayed, which shows the effect of each item the user enters on the form. It adds a sort of race-to-the finish to entering your return — how low will it go? Intuit also offers good on-line tax advice, in the software, and also at the Web site.

Cost: Basic — \$34.95 Deluxe — \$39.95

<http://www.quicktax.ca>

TaxWise

This package is only available by electronic delivery, with a download of 630KB. It's very easy to use and has a good layout on the screen.

The "guided tour" was very well implemented. Although it follows the general layout of the tax return, this package seemed to follow a more logical pattern than some of the others. I also liked the simple yes or no answers — they provided easy access to any part of the program.

Cost: \$26

<http://www.taxwise.com> (26)

John Newcombe is an accountant and information technology specialist with a background in tax for small- and home-based business. He can be reached by e-mail at john@newcom.com



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ON93

NEW PRODUCTS

Software to Grow On

Strategic Consultants Inc., of Richmond Hill, Ont., says its Nagelose Workstation EIS and Nagelose Workstation EIS applications will help small businesses grow.

The products include tools to enhance business management. According to the company, Nagelose Workstation EIS, with 150 built-in management reports and growing methodology, lets an entrepreneur see where the business is profitable, from a product, customer, category or sales rep point of view. The software works behind the scenes to draw data from the business's accounting and inventory management systems and turn that data into information. Connectors for AscPac, Great Plains, Dynamics, Business Vision and Excel Account Mate are available.

Workstation EIS includes functions within Workstation EIS plan marketing and sales management. The Marketing Console lets the entrepreneur create, support and measure marketing activities. The software also provides direct access to sales opportunities. Through its Outlook Connector, it can place sales opportunities through the Internet to any sales rep's desktop or mobile computer.

The Nagelose Workstation EIS and the Workstation EIS are priced at \$2,990 and \$5,990 respectively. See <http://www.attnet.com>.

ATI Eases the Mac

ATI has announced three new graphics boards for the Apple Macintosh market, using the Rage 128 graphics accelerator chip. ATI says these products "demonstrate ATI's ongoing commitment to the Mac market."

The new products include the Radeon VR 128 multifunctional 128-bit accelerator (priced at \$249, including the TV tuner), ATI's Rage One aimed at the Mac power gamer, priced at \$299, and the Raveo 128, priced at \$495 — a 128-bit graphics card meant to deliver professional 2D and 3D performance "at a mainstream price." See <http://www.atitech.com>.



Intel ships New Xeon Processor

Intel Corp. has announced 450MHz additions to its Pentium II Xeon processor family.

The new processors include 512KB, 1MB and 2MB of Level 2 cache and are intended to support servers and workstations using four or more processors.

Intel says these processors, equipped

with 2MB of Level-2 cache, have been selected more than 10 per cent greater performance than systems using a 400MHz Pentium II Xeon processor with 1MB of Level-2 cache.

In 1,000-unit quantities, the 450MHz Pentium II Xeon processor with 512KB of Level 2 cache costs \$104, with 1MB of Level 2 cache, it costs \$138, and with 2MB of Level-2 cache, costs \$162. See <http://www.intel.com>.

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Reader Poll

PRICE TO PERFORMANCE

Our Question to You:

SR EIS, introduced on Jan. 1, may dramatically increase the costs of CD-recording media and require a ton of up to 30 cents per 15 minutes of digital recording time on blank CDs. See <http://www.cip.ca/english/news/eng/eng-cd-0101.html>.

With the proposed levy potentially adding \$2.50 to the price of blank CD media, how would this impact the CD-R market?

- ☐ This levy would have little effect on sales
- ☐ This levy would slow sales, but the market would persevere
- ☐ The market would abandon the market and move to CD-RW
- ☐ The market would abandon CD technology altogether and move to other removable storage options.

Last Issue, We Asked:

What technology has the best chance of making color printers mainstream?

You Said:

- 96% Color ink-jets will be the most significant opportunity for growth in business printing
- 52% Color lasers will be the most significant opportunity for growth in business printing
- 91% Other technologies, such as LED (with potential for higher speeds), will bring opportunities for growth in business color printing
- 67% The business market for color won't grow substantially in 1999

Win a FREE printer??

Vote in our Reader Poll: A randomly drawn winner will get an Epson 2500 color ink-jet printer from Okidata!



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